Innovative mechanisms of the cross-sectoral interaction between business and public authorities in conditions of information society's transformation

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Abstract

The article is aimed to identify ways of implementation of the foresight technology as an innovative mechanism which can provide the partner cooperation between business and public authorities in conditions of a digital society. The methodology of the research is the synergistic paradigm for the study of interaction processes in the fields of economic and public administration in conditions of transition from the information society to the digital one. The scientific originality of the article lies in the possibilities of the foresight use at regional and local levels in conditions of the transformation of the information society. Its practical significance is that specific mechanisms and methods for the implementation of foresight projects, which can be used at the regional level, have been identified.

INTRODUCTION

At the time, problems of the transition from the industrial to the post-industrial/informational society first mastered thoughts of the most progressive scientists and then kept the attention of all scientists without exception. Such a large volume of scientific literature is devoted to the theory of the information society that it is pointless to refer to it. We can only note that before all this was seen as a picture about the future, that is, futurology, but half a century has passed since that transition happened, and we assume the courage to follow the idea that the future of humanity is connected with a new stage of its development, the digital one.

The fact of the transformation of the information society is used as the general background of identifying the newest innovative mechanisms of the public governance that can adequately meet the new challenges of digital development and contribute the development of value chains (Koval et al., 2019). The Foresight is one of such future-designing technologies, which can consider the possibilities of digital technologies.

The picture of the future is the same important both for the individual and for the whole of humanity as the understanding of the past. Knowledge of the future took different forms in different historical eras, evolving from ancient prophecies to the futurology of the twentieth century and scientific prognostics of the twenty-first century.

Foresight, having combined the best ideas of the forecasting and strategic planning, has become one of the most effective technologies for designing the development of the society today, but the Foresight is based not on the past, it is based on the future. This is exact principle of thinking that is used in the process of transforming the information society into a digital one which significantly changes the structure of trade flows and necessitates the adaptation of national regulatory systems (Koval, Pukała, 2017; Prystupa et al., 2019). The latest scientific and technological revolution has created all conditions for the transition to digital methods of society management, forming and designing its future.

The Foresight idea entered actively the scientific papers of researchers of the problems of forecasting and planning of social development in the late XX – early XXI century. Significant contributions to the development of the Foresight theory have been made by Cuosa (2011), Popper et al. (2007), Habegger (2010), Gainutdinova (2018).

It should be noted that there were not only European and North American scientists, but also representatives of Russia, Japan and other countries of Southeast Asia.

The Foresight technology is just beginning to be used in Ukraine, but it is becoming more and more popular every year. Researches in this sphere address both the “classic” Foresight problems of the methodology of the future’s research (Sukhorolskyi & Sukhorolska, 2018) and the issues of the Foresight application at the level of regions and communities (Kravchenko, 2015; Tsedik, 2016).

Some attempts to conduct Foresights of Ukrainian society’s development were made (Zgurovsky, 2015). Interesting researches showed the enthusiasm and high intellectual level of authors, but did not reveal the technological and methodological side of Foresight projects.

In 2018, the "Ukraine’s Foresight. Four scenarios for Ukraine's development" was conducted by the Ebert Foundation. In the research foreign experts gave their vision on Ukraine’s ways of development against the crisis of international dialogue with Russia. The executors of this Foresight project used the scenario approach for the identification of key factors that may affect Ukraine's future (Samuel et al., 2018).

The aim of the article is to clarify the ways of the Foresight technology’s implementation as an innovative mechanism that can ensure the partner cooperation between business and public authorities in conditions of a digital society.

DEVELOPMENT

The origins and definitions of the Foresight.

For the first time, the term "foresight" was used in 1932 by Herbert Wells (1932), the science fiction writer. As a technology of the practical application of the reasoned foresight, the Foresight was developed and applied firstly in the military sphere and only later became a technology in the sphere of social development. All leading countries in Europe, Southeast

Asia, Japan and the USA show numerous examples of Foresights applications (Gokhberg, 2013).

The Foresight has gradually become one of the most effective tools of the innovative formation of the society. Since the 1990s, the Foresight is used actively in developed countries in the public administration as well as during the development of strategies, projects and programs for regional and local government (Cuosa, 2011).

Like any new concept that is just "being embedded" into the system of ideas about the development of society, the Foresight has many definitions.

The common in these points of view is that the Foresight is understood as a process aimed at defining a possible future, creating its desired image and building a "road map" for its achievement. Most Foresight theorists and practitioners understand it as some kind of combination of "product" (predictions, scenarios, priorities) and "process" (networking of all interested sides). This should contribute not only to studying the future, but also to achieving the consensus in the society through a constructive dialogue between politicians, the public, experts and business representatives.

The Foresight can also be defined as a special technology, which forms the development priorities for the different spheres of society. Its aim is to mobilize as many participants as possible in order to achieve brand-new results in the real future using digital technologies.

Advantages of the Foresight over traditional methods of socio-economic forecasting and strategy.

There are advantages as the following:

1. The Foresight includes the participation of many interested sides (stakeholders) - representatives of different segments of society, not only in the formation of the picture of future, but also their engagement into active actions to implement the changes they predict.

It should be highlighted that there are three participants in such social interaction – the government, business and civil society. Today's realities show that civil society on the territory of the republics of the former USSR is still rather weak, it is only in a state of development and formation. That's why, the civil society can't act as a full partner of the government and business yet. Meanwhile, the development of cooperation between the government and business, together with the influence of global civil society, contributes objectively to the emergence of the civil society (Gainutdinova, 2009).

2. Experts are one of the most important components of the study.

As experts need to be involved directly in the Foresight implementation process, it is expected that they have the necessary feeling on measures of preventative influence and are ready to use the resources they have adequately.

3. The Foresight, as noted, is not a method, but a technology that incorporates methods developed within various scientific spheres.

It is a set of tools that allow predicting actively the problems of future and influencing it through reconciling the particular interests of different segments of society. Predictions are

usually made by a narrow range of experts and in most cases are associated with the forecasting of unmanaged events.

Foresight is about assessing the possible perspectives of the innovative development, which relate to the science and technology progress. The possible technological horizons are outlined by the Foresight along with possible effects in the socio-economic development of the country, region, community, and business structure. Such horizons can be reached by investing certain funds and organization of systematic work by the authorities and businesses. Unlike forecasts, the Foresight always means intensive mutual discussions and surveys of certain populations groups, which are interested directly in solving problems that need to be solved during the Foresight project.

4. Another difference of the Foresight from traditional forecasts and programs of socio-economic development is its focus on the development of practical steps to achieve the selected strategic guidelines.

At the same time, the special attention is paid to reaching consensus among the main "players" on the most important strategic directions of development by organizing their constant dialogue. The Foresight can also be a sort of culling tool that helps to overcome the widespread irresponsibility towards the future. Many want to talk about the future, but not everyone is ready to take responsibility for it. Therefore, in the Foresight not only the result but also the process of its obtaining is important finally. The predictions become active elements of the future's formation only in the concentration of efforts of the transformation process's participants and the coherence of their actions (Kvitka, 2018).

The Foresight's methodology.

The methodology of each particular Foresight is determined always on the basis of the objectives of the project and its scope. The sets of methods and tools, used in the Foresight, are numerous and various. On the one hand, we have methods of quantitative estimation of existing trends and their consequences, using the specially designed models and computers usually. On the other hand, and it is the largest group, these are methods, based on expert knowledge, on the formation of special procedures and techniques of work with experts. By its essence, the Foresight is a system of methods for expert assessment of strategic directions of socio-economic and innovative development, the identification of technological breakthroughs that can influence the development of society in the medium- and long-term perspective (Miles, Popper, 2008).

Among the most commonly used Foresight methods are: Delphi method, critical technology definition, scenario development, expert panels.

Delphi Method.

The Delphi method is the most widely used Foresight method. It was developed in the 1950s-60s by the RAND Corporation during the research of perspectives of the military complex development, and in the 70s it was used already in technological forecasting and corporate strategic planning.

The main difference between this method and the usual expert surveys is that the feedback should be provided to experts. The Delphi method provides for not a single one-on-

one polling, but at least two iterations of a survey for the same group of experts (the classic Delphi variant is characterized by 3 to 8 iterations). In the following rounds, in addition to the same set of questions, respondents get the generalized survey results, which were obtained in the previous stages. Ideally, experts should be informed about the validity of certain judgments, especially if opinions are extreme or extraordinary. Thus, feedback and empowerment of respondents to adjust their estimates accordingly to others is aimed at encouraging information sharing and showing each individual expert how different their estimates and expectations are from others. In addition, surveys anonymity aims to reduce the impact of the most active or reputable experts on the individual ratings of other panel members (Kryvoshein, 2017).

Critical technologies.

The term “critical technologies” originates from the so-called critical materials. In the mid- twentieth century, there was the term for the equipment and raw materials that were not manufactured in the United States but were necessary for the effective functioning of the armed forces. It was believed that the country should have a five-year reserve of such critically important materials in the event of possible military conflicts. In this context, the literal translation from the English word "critical" is "badly needed, deficit". Due to some translation peculiarities, the term "key technologies" is used in some countries.

Method of scenario development.

The method of scenario development is effective as an addition to researches done using other methods. The most common is the practice of creation of “top-to-down” scenarios. It is based on an analysis of future opportunities and alternative development trajectories of their achievement. In the context of the Foresight conduction, this is a way of presenting a possible future in the form of a "dramatic" scenario.

Scenarios may include a diachronic element, that is, to use a description of the factors that have influenced the development of the situation in the past. They may also be synchronous: in this case the future way of events’ development is connected only with the description of the current situation. In this case, having a schematic representation of the future situation as a starting material, the starting situation is restored and the ways of its development are constructed retrospectively.

It is worth emphasizing that in the process of the transformation of informational society into the digital one, the Foresight technology is developing also. It is being constantly updated with new tools, especially those related to the development of digital technologies. This includes the conduction of Delphi expert surveys using the latest GoogleForm platforms and tools.

Road maps.

Roadmaps are the result of the Foresight. They are an official document, where the ways of object’s development are outlined and the appropriate steps to achieve the necessary parameters in the future are described. On their basis, the development strategies are formed and long-term priorities are identified. In fact, roadmaps suggest an already set future with a detailed description of main stages and practically possible mechanisms (ways) of achieving

it. Thus, they are the one of the key tools for the purposeful activity of stakeholders that represent power and business.

In such case, roadmaps perform several functions:

1. Allow forming a unified and coherent orientation space according to the future of the country (industry, region, city, etc.).
2. Serve as a basis for creating strategies and development goals.
3. Are the basis for making important decisions in problematic and conflict situations of the interaction between government and business.
4. Allow coordinating the political activities and, accordingly, encouraging different actions of different players of political and economic space.

Technologically road maps are also designed to develop a visual representation of the medium-term development strategy. So, to speak, if we know where we want to go or what we want to achieve - our job is to answer the question – what is the best way to reach it?

The Foresight at local and regional level.

In Ukraine the situation with the introduction of the Foresight at the national level is significantly complicated by the existence of established "oligarchic" relations of the authorities with big business. The latter is interested in keeping the maximum possible status quo in order to ensure its monopoly control in the relevant fields of production and services. The situation here can change only in the conditions of "liberation" of the state from the "support" of oligarchic capital and transition of "virtual" economy into the real existence.

Meanwhile, though the above-mentioned problems exist both at the local and regional levels, they still provide some space for the initiative and implementation of the latest digital forms of the cross- sectoral interaction. This includes the opportunities for conducting Foresights of the territorial development.

Within the framework of the decentralization reform in Ukraine, the united territorial communities are being formed (UTC). They start their work from scratch, from blank paper. In these circumstances, the parties, interested in the development of UTC, are able to determine the guidelines for the further development of the community. By the experience of attempt to use the fast Foresight in Zelenodolsk and Peschansky UTCs of Dnipropetrovsk region, such stakeholders were, first of all, representatives of local business, employees of local educational and health institutions, active members of sports and cultural public organizations (Kvitka et al., 2019). The initiator and active promoter of the Foresight is the leadership of executive bodies of local government, and the brake, oddly enough, is the deputy corps.

The Foresight "Strategy of development of Peschansky UTC" (Dnipropetrovsk region) showed that participants of expert panels in this UTC, interested in the determination of future, expressed the natural desire not only to discuss and define development goals, but also to participate in the implementation of the planned projects:

- Use of existing natural resources, including waste from industrial enterprises, groundwater, forests, etc.

- Processing and packing of agricultural products, organization of sales of local agricultural products.
- Beautification of their places of living, including provision of transport, water supply and lighting.

- Youth policy aimed at maintaining the attractiveness of one's own city, village, village for young people, including ensuring access to sports, places for cultural rest, high-speed Internet access.

Last point, but not the least - access to the network - is considered by experts to become more and more relevant as an indicator of “civilization” of the place of residence. More and more modern young people are becoming "network" people for whom, mostly, there is no difference where they live if they have full access to the World Wide Web.

The practical experience of the Foresight’s use for the development of UTC was also used for the determination of perspectives of digital society’s development in Dnipropetrovsk region. It was conducted by the remote method under the creation of the regional program "Electronic Dnipropetrovsk region" for 2020 - 2022 years and engaged an expert survey of 554 persons who included the authorities, business, science and the public.

The Delphi survey questionnaire was designed on the basis of the results of a preliminary analysis of the condition of "informatization" in the region. The experts were asked to answer questions about the level of development of the digital society of Dnipropetrovsk region by the following estimates:

1 - Not important / incredibly / very low. 2 - Little important / little likely / low.

3 - Important to some extent / probably to some extent / medium. 4 - Important / probably / high level.

5 - Very important / very likely / very high level. 0 - Difficult to answer.

The Foresight results given below, made it possible to include significant aspects of public administration digitization to Dnipropetrovsk Region Electronic Informatization Program for 2020 - 2022 (Dnipropetrovsk Region Council, 2019). In fact, the draft program of Dnipropetrovsk Regional Council, which was submitted for approval in October 2019, is a roadmap for the implementation of the idea of digital society in the region in accordance with world standards, which takes into account the interaction of government, business and civil society institutions.

The following digital development indices defined by the International Telecommunication Union and other specialized UN units were taken as the basis of the research: ICT development index (2017) – Internet access, digital inequality issues; E-Government Development Index (2018) – Information and Communication Structure and Document Management; E-Participation Index (2018).

Results.

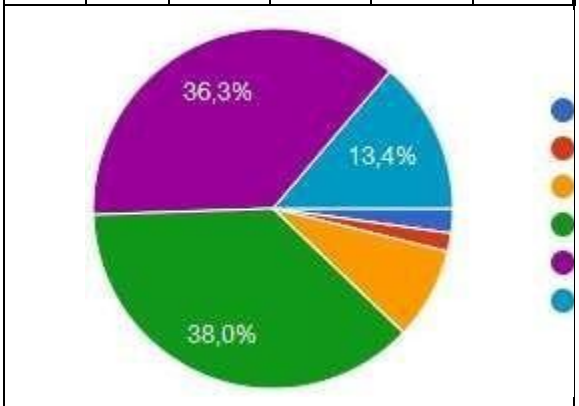
The Foresight research allowed suggesting a number of conclusions regarding the digital development of one of the most industrial regions of Ukraine (Electronic

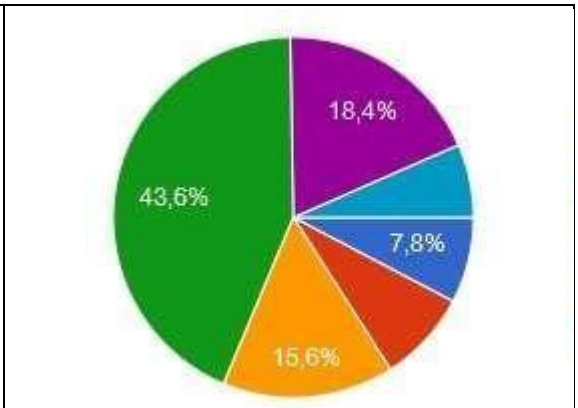
Dnipropetrovsk region 2020-2022, 2019). The peculiarity of the research was that there were more than 29% of business representatives and 30% of representatives of civil society institutions among the experts. Other experts were representatives of public authorities and budgetary institutions. This provided a qualitative presentation of different opinions and, accordingly, a synergistic effect of the cross- sectoral interaction.

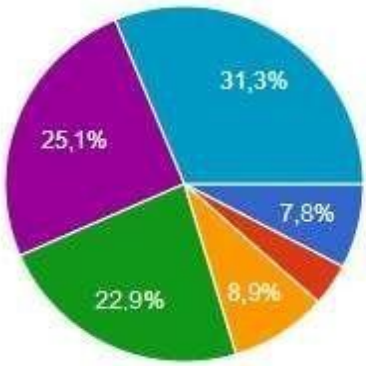
According to data of Table 1 by experts' opinions, the level of Internet access in Dnipropetrovsk region is at a rather low level, although it is a bit higher than the index of the International Telecommunication Union for the whole country. At the same time, the level of the information security is poor. One can even say that cyber threats are an urgent problem in Ukraine. The same applies to assessing the level of the digital piracy. Too high figures indicate a clear shortcoming on the part of the authorities to end such criminal practice.

Table 1. Level of development of information and communication infrastructure.

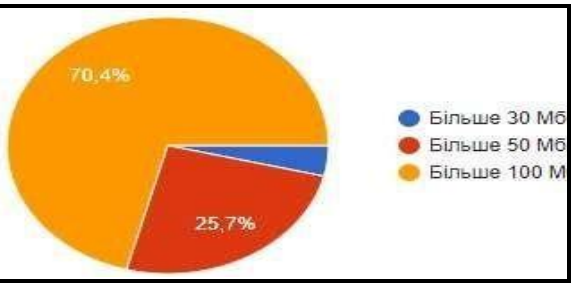
Quality of the Internet access	Score			2	3	4	5
	Survey data			4	2	3	3
		,6%	,6%	,5%	1,2%	5,8%	7,4%
Quality of Internet-providers services	Score			2	3	4	5
	Survey data			6	3	4	1
		,0%	,7%	,2%	1,3%	3,6%	7,3%
Quality of 3G/4G mobile internet services	Score			2	3	4	5
	Survey data			8	3	3	1
		,2%	,7%	,4%	8,0%	6,3%	3,4%
	Score			2	3	4	5
				1	4	1	6
		,8%	,4%	5,6%	3,6%	8,4%	,2%



Degree of informational systems' protection	Survey data						
Degree of cyber-threats	Score			2	3	4	5
	Survey data	,3%	,4%	1 5,6%	2 4,0%	2 8,5%	2 1,2%

Degree of software piracy	Score			2	3	4	5
	Survey data	,8%	,9%	8 ,9%	2 2,9%	2 5,1%	3 1,3%
							
The degree of enterprises and organizations' innovation activity in the sphere of digital technologies	Score			2	3	4	5
	Survey data	,0%	,3%	2 0,7%	4 3,6%	1 9,6%	3 ,9%

The possible speed of Internet access in the region in 2022	Survey data
Over 30 Mb/sec	3,9%
Over 50 Mb/sec	25,7



	%	
Over 100 Mb/sec	70,4 %	

The necessity to implement the “cloud” technologies	Score			2	3	4	5
	Survey data	,4%	,2%	6,1%	16,8%	27,4%	44,1%
The level of potential demand for digital goods, jobs and services among the population	Score			2	3	4	5
	Survey data	,6%	,1%	7,3%	25,1%	41,3%	24,6%
The level of use of digital technologies by budget organizations	Score			2	3	4	5
	Survey data	,1%	,5%	27,9%	35,2%	23,5%	7,8%
The level of potential demand for digital goods, products and services among enterprises and organizations in general	Score			2	3	4	5
	Survey data	,4%	,6%	6,7%	29,1%	45,3%	15,1%
The level of potential demand for digital products, jobs and services in budget organizations	Score			2	3	4	5
	Survey data	,8%	,0%	11,7%	29,1%	35,8%	15,6%
The level of innovative activity of enterprises and organizations in the sphere of digital technologies	Score			2	3	4	5
	Survey data	,0%	,8%	15,1%	37,4%	32,4%	7,3%

Source: based on materials of Electronic Dnipropetrovsk region 2020-2022 (2019)

The level of the e-democracy in any country is linked closely to the characteristics of traditional democracy and, above all, to the peculiarities of the rule of law and civil society. Taking into account the development of these two factors, Ukraine occupies a very middle place in the world ranking. These is reflected also by the results of the research. At the same time, it is necessary to mention the great demand and willingness for the e-democracy from the population.

E-Government in Ukraine is developing actively during the last 4 years. It happened mostly thank to international grants. Meanwhile, in 2 years from 2016 to 2018, Ukraine's international rating dropped by 20 points. No clear explanation for this situation has been given yet. According to all expectations of specialists, counting the high volume of advancement of digital technologies, it should be the opposite. Perhaps this is somehow correlated with the general assessment of country's public authority corruption and influences directly the attitude to the e-gov.

The results of this study have rather raised a number of questions, which need further research, than gave a clear vision of ways to solve the described problems.

Table 3. Level of electronic governance development.

Level of e-government development in general	Score		1	2	3	4	5
	Survey data	,2%	6,1%	19,0%	43,0%	26,3%	3,4%
Quality of the site of the authority	Score		1	2	3	4	5
	Survey data	,8%	3,4%	10,1%	30,2%	39,1%	14,5%
Quality of provision of electronic administrative services	Score		1	2	3	4	5
	Survey data	,0%	6,1%	15,1%	35,2%	30,7%	7,8%
Level of use of electronic document flow (including electronic signature)	Score		1	2	3	4	5
	Survey data	,2%	11,2%	15,6%	36,3%	25,7%	8,9%
Quality of e-procurement system	Score		1	2	3	4	5

	Survey data	,9%	5,0%	11,7%	35,2%	29,1%	10,1%

Source: based on materials of Electronic Dnipropetrovsk region 2020-2022 (2019)

CONCLUSIONS.

It can be said that the Foresight as a modern technology for designing and programming the future has necessary methods and tools for creating strategies and projects of the socio-economic development in conditions of digital society development. Such examples are shown by countries with the developed democracy.

The Foresight's core is based on the powerful potential of a synergistic model of the cross-sectoral engagement and the combination of efforts of various political and economic players, aimed at the achievement of clearly defined and really possible parameters of the social development.

The use of the Foresight technologies opens up new opportunities for public administration to reach political consensus and cross-sectoral consent in Ukrainian society.

The peculiarities of country's digital society development in one of the industrialized regions of Ukraine have been determined on the example of research of territorial communities' electronic readiness, made by the Foresight technology. Experts from three sectors of society - authority, business, civil society - took part in the Foresight. The expert survey was conducted using the Delphi method. The roadmap of the further development of information society in the region was presented in the form of Dnipropetrovsk region's informatization program "Electronic Dnipropetrovsk region 2020-2022", which is being discussed actively by deputies of the regional council, representatives of business associations and civil society institutions.

The results of the Foresight showed important problems and directions for further work on the development of digital economy and digital society in the region, such as:

- The level of access to the high-speed Internet in rural areas is far behind urban indices. The situation can be characterized as digital inequality, which leads to a restriction of population's access to e-services and is an obstacle to the development of the e-government in the local

government. Experts see the solution to the issue in the dissemination of 4G mobile network access technologies through public-private partnerships.

- Along with the great desire of population to develop the e-democracy, there is a problem of improper work of relevant digital resources. Another actual problem is the lack of necessary knowledge and skills among the representatives of the civil society and population in general.

- E-Government is developing actively in terms of technology and software, but its efficiency is still very low. By experts' opinion, it is caused by the low level of digital

competencies of public officials and this requires special training programs and retraining of employees of public administration bodies.

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